

# Employee Data Analysis Report

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## 1. Dataset Description

### 1.1 Source

- Internal office employees dataset (1,000 records)

### 1.2 Columns

- employee\_id – Unique identifier
- employee\_name – Employee's full name (939 unique, some duplicates)
- department – 6 unique departments (e.g., HR, Marketing, Finance, Accounts, Purchasing, etc.)
- state – 5 states represented (major share from Alaska & California)
- salary – Ranges from 1,006 to 9,985
- age – Ranges from 20 to 50 years
- bonus – Ranges from 500 to 2,000

### 1.3 Data Quality

- No missing values
- Clean and consistent
- Balanced structure with geographic and departmental diversity

## 2. Operations Performed

### 2.1 Data Cleaning & Exploration

- No missing/null values observed
- Checked unique values in categorical columns
- Summarized numerical columns (mean, median, standard deviation, IQR)

### 2.2 Descriptive Analytics

- Departmental employee count (pie chart)
- State-wise employee distribution (bar chart)
- Salary & Age distribution analysis (histograms, boxplots)
- Bonus distribution (histogram)

## 2.3 Relationship Analysis

- Age vs. Salary (bubble chart with bonus as size factor)
- Department vs. Bonus comparison
- Salary variations by state

## 3. Key Insights

### 3.1 Workforce Demographics

- Age distribution centers around 25–40 years → young to mid-career dominant
- Average employee age: 35.3 years
- Fewer employees above 45 → lower senior-level representation

### 3.2 Departmental Insights

- HR has the largest workforce (171 employees)
- Other departments are fairly balanced in size
- Larger departments (e.g., HR, Marketing) may indicate operational importance

### 3.3 Salary Insights

- Salary range: 1,006 – 9,985
- Average salary: ~5,330
- Median salary: 5,188
- Salaries are moderately spread (Std Dev  $\approx$  2,603)
- Mid-level salaries dominate; high salaries likely belong to senior executives

### 3.4 Bonus Trends

- Bonus range: 500 – 2,000
- Average bonus: 1,253
- Median bonus: 1,245
- Fairly distributed, suggesting performance-based incentives
- Marketing & Finance departments likely receive higher bonuses

### 3.5 Geographic Spread

- Employees distributed across 5 states
- Alaska has the highest concentration (209 employees)
- California also has a significant share
- Smaller states likely host branch or satellite offices

#### 4. Recommendations

##### 4.1 Talent Development & Retention

- Encourage leadership training for younger employees to prepare for senior roles
- Improve retention strategies for employees over 45 to maintain experience balance

##### 4.2 Compensation Strategy

- Conduct pay equity analysis to reduce disparities across departments
- Align high salaries with measurable performance outcomes
- Review bonus policies for fairness and motivation across all teams

##### 4.3 Workforce Allocation

- Reassess HR's large headcount—potential overstaffing
- Consider reallocating resources to core business functions (e.g., Marketing, Finance)

##### 4.4 Geographic Operations

- Evaluate why Alaska has the highest concentration—operational necessity or imbalance?
- Consider diversifying workforce presence to reduce dependency risk

##### 4.5 Future Analytics Opportunities

- Develop predictive models (e.g., attrition prediction, salary forecasting)
- Use clustering to group employees by salary, age, and bonus for strategic HR planning
- Track department productivity vs. compensation to refine budgeting